

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) An ~~MEMS~~-ink jet printhead comprising a multi-layer silicon substrate, said multi-layer substrate comprising:
a silicon substrate;
drive transistors and CMOS interconnect layers formed on said silicon substrate;
a passivation layer covering said drive circuitry and CMOS interconnect layers; and
a plurality of nozzles mounted on said passivation layer~~having a plurality of nozzles,~~
each nozzle comprising:
a chamber adapted to contain an ejectable liquid; and,
at least one droplet ejection actuator associated with each of the chambers
respectively, the droplet ejection actuator being electrically connected to a respective drive transistor and adapted to eject a droplet of the ejectable liquid from the nozzle,
wherein the chambers are ~~mounted on a passivation layer of the silicon substrate and are at~~
least partially formed by an amorphous ceramic material.
2. (Previously Presented) An ink jet printhead according to claim 1 wherein the drop ejection actuator is a heater element configured for thermal contact with a bubble forming liquid within the chamber; such that,
heating the heater element to a temperature above the boiling point of the bubble forming liquid forms a gas bubble that causes the ejection of a droplet of the ejectable liquid from the nozzle corresponding to that heater element.
3. (Original) An ink jet printhead according to claim 1 wherein the amorphous ceramic material is silicon nitride.
4. (Original) An ink jet printhead according to claim 1 wherein the amorphous ceramic material is silicon dioxide.
5. (Original) An ink jet printhead according to claim 1 wherein the amorphous ceramic material is silicon oxynitride.

6. (Original) An ink jet printhead according to claim 2 wherein the ejectable liquid is the same as the bubble forming liquid.
7. (Original) An ink jet printhead according to claim 1 wherein the printhead is a pagewidth printhead.
8. (Withdrawn) An ink jet printhead according to claim 1 wherein the droplet ejection actuator is a paddle vane located within the chamber, the paddle vane being adapted to be actuated by a thermal actuator for ejecting a droplet of the ejectable liquid;
a thermal actuator located externally of the chamber and attached to the paddle vane, wherein the thermal actuator includes a plurality of separate spaced apart elongate thermal actuator units, which are interconnected at a first end to a substrate and at a second end to a rigid strut member.
9. (Withdrawn) An ink jet printhead as claimed in claim 8 wherein the rigid strut member is connected to a lever arm having one end attached to the paddle vane.
10. (Withdrawn) An ink jet printhead as claimed in claim 1 wherein the thermal actuator units operate upon conductive heating along a conductive trace, the conductive heating including generation of a substantial portion of the heat in an area adjacent the first end of each thermal actuator unit.
11. (Withdrawn) An ink jet printhead as claimed in claim 4 wherein said conductive heating includes a thinned cross-section adjacent said first end.
12. (Withdrawn) An ink jet printhead as claimed in claim 1 wherein the thermal actuator units comprise conductive heating layers which, in turn, comprise substantially either a copper nickel alloy or titanium nitride.
13. (Currently amended) A printer system which incorporates a MEMS inkjet printhead, the printhead comprising a silicon multi-layer substrate having a plurality of nozzles, each nozzle comprised ofing:
a silicon substrate;
drive transistors and CMOS interconnect layers formed on said silicon substrate;

a passivation layer covering said drive circuitry and CMOS interconnect layers; and
a plurality of nozzles mounted on said passivation layer, each nozzle comprising:

a bubble forming chamber adapted to contain a bubble forming liquid; and,
at least one heater element disposed in each of the bubble forming chambers respectively,
the heater elements being electrically connected to a respective drive transistor and
configured for thermal contact with the bubble forming liquid; such that,

heating the heater element to a temperature above the boiling point of the bubble
forming liquid forms a gas bubble that causes the ejection of a drop of an ejectable liquid
from the nozzle corresponding to that heater element,
wherein the bubble forming chambers are ~~mounted on a passivation layer of the silicon~~
~~substrate and are at least partially formed by of~~ an amorphous ceramic material.

14. (Cancelled)

15. (Original) A printer system according to claim 13 wherein the amorphous ceramic material is silicon nitride.

16. (Original) A printer system according to claim 13 wherein the amorphous ceramic material is silicon dioxide.

17. (Original) A printer system according to claim 13 wherein the amorphous ceramic material is silicon oxynitride.

18. (Original) A printer system according to claim 14 wherein the ejectable liquid is the same as the bubble forming liquid.

19 (Original) A printer system according to claim 13 wherein the printhead is a pagewidth printhead.

20. (Withdrawn) A printer system according to claim 13 wherein the droplet ejection actuator is a paddle vane located within the chamber, the paddle vane being adapted to be actuated by a thermal actuator for ejecting a droplet of the ejectable liquid;

a thermal actuator located externally of the chamber and attached to the paddle vane, wherein the thermal actuator includes a plurality of separate spaced apart elongate thermal actuator units, which are interconnected at a first end to a substrate and at a second end to a rigid strut member.

21. (Withdrawn) A printer system as claimed in claim 20 wherein the rigid strut member is connected to a lever arm having one end attached to the paddle vane.

22. (Withdrawn) A printer system as claimed in claim 13 wherein the thermal actuator units operate upon conductive heating along a conductive trace, the conductive heating including generation of a substantial portion of the heat in an area adjacent the first end of each thermal actuator unit.

23. (Withdrawn) A printer system as claimed in claim 16 wherein said conductive heating includes a thinned cross-section adjacent said first end.

24. (Withdrawn) A printer system as claimed in claim 13 wherein the thermal actuator units comprise conductive heating layers which, in turn, comprise substantially either a copper nickel alloy or titanium nitride.

25. A method of ejecting drops of an ejectable liquid from a MEMS^{an} inkjet printhead, the printhead comprising a ~~silicon multi-layer~~ substrate ~~having a plurality of nozzles, each nozzle comprising~~ of:

a silicon substrate;

drive transistors and CMOS interconnect layers formed on said silicon substrate;

a passivation layer covering said drive circuitry and CMOS interconnect layers; and

a plurality of nozzles mounted on said passivation layer, each nozzle comprising:

a chamber adapted to contain an ejectable liquid; and,

at least one droplet ejection actuator associated with each of the chambers

respectively, the droplet ejection actuator being electrically connected to a respective drive transistor,

wherein the chambers ~~are mounted on a passivation layer of a silicon substrate and~~ are at least partially formed ~~by~~ of an amorphous ceramic material;

the method comprising the steps of:

placing the ejectable liquid into contact with the drop ejection actuator; and
actuating the droplet ejection actuator using said drive circuitry such that a droplet of
an ejectable liquid is ejected from the corresponding nozzle.

26. (Previously presented) A method according to claim 25 wherein the drop ejection actuator is a heater element configured for thermal contact with a bubble forming liquid within the chamber; such that,
heating the heater element to a temperature above the boiling point of the bubble forming liquid forms a gas bubble that causes the ejection of a droplet of the ejectable liquid from the nozzle corresponding to that heater element.

27. (Previously presented) A method according to claim 25 wherein the amorphous ceramic material is silicon nitride.

28. (Previously Presented) A method according to claim 25 wherein the amorphous ceramic material is silicon dioxide.

29. (Previously Presented) A method according to claim 25 wherein the amorphous ceramic material is silicon oxynitride.

30. (Previously Presented) A method according to claim 26 wherein the ejectable liquid is the same as the bubble forming liquid.

31. (Previously Presented) A method according to claim 25 wherein the printhead is a pagewidth printhead.

32. (Withdrawn) A method according to claim 25 wherein the droplet ejection actuator is a paddle vane located within the chamber, the paddle vane being adapted to be actuated by a thermal actuator for ejecting a droplet of the ejectable liquid;
a thermal actuator located externally of the chamber and attached to the paddle vane, wherein the thermal actuator includes a plurality of separate spaced apart elongate thermal actuator units, which are interconnected at a first end to a substrate and at a second end to a rigid strut member.

33. (Withdrawn) A method as claimed in claim 32 wherein the rigid strut member is connected to a lever arm having one end attached to the paddle vane.

34. (Withdrawn) A method as claimed in claim 25 wherein the thermal actuator units operate upon conductive heating along a conductive trace, the conductive heating including generation of a substantial portion of the heat in an area adjacent the first end of each thermal actuator unit.

35. (Withdrawn) A method as claimed in claim 29 wherein said conductive heating includes a thinned cross-section adjacent said first end.

36. (Withdrawn) A method as claimed in claim 25 wherein the thermal actuator units comprise conductive heating layers which, in turn, comprise substantially either a copper nickel alloy or titanium nitride.